SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS
4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

April 7, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7304

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 30379

Samples were taken on 2/12/93 and 2/19/93, and were received at Sound on 2/24/93. Samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons in accordance with EPA SW-846 Method 8015 Modified, and Total Petroleum Hydrocarbons in accordance with EPA Method 418.1.

VOLATILE ORGANICS
Samples 30379-1 through 30379-3 were analyzed on 3/01/93, 3/02/93, and 3/03/93. Methylene chloride, acetone, and toluene were detected in the method blanks associated with this sample group at levels above the IDL. Where detected in the associated sample, results for these compounds were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS
Samples 30379-1 through 30379-3 were extracted on 3/02/93 and analyzed on 3/05/93 and 3/10/93. Di-n-butylphthalate was detected in the method blank at a level above the IDL. Where detected in the associated samples, results for this compound were flagged B to indicate this. Percent recoveries for 1,4-dichlorobenzene and 1,2,4-trichlorobenzene in the matrix spike/matrix spike duplicate analysis were below QC limits. All other QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS (MODIFIED 8015)
Samples 30379-1 through 30379-3 were extracted on 2/26/93 and analyzed on 3/01/93. No contaminants were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS (418.1)
Samples 30379-1 through 30379-3 were extracted and analyzed on 2/25/93. No contaminants were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental
Seattle Facility

Date: March 22, 1993

Report On: Analysis of Soil

Lab No.: 30379

IDENTIFICATION:
Samples received on 02-24-93
P. O. No. 32172
Project: P91 - Project 624878 Task #7304

ANALYSIS:

Lab No. 30379-1 Client ID: CP-11513-38-40 45076-1

Volatile Organics by Method 8240
Date Extracted: 3-3-93
Date Analyzed: 3-3-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	500	
Bromomethane	ND	500	
Vinyl Chloride	ND	500	
Chloroethane	ND	500	
Methylene Chloride	1,200	250	B2
Acetone	ND	2,500	
Carbon Disulfide	ND	250	
1,1-Dichloroethene	ND	250	
1,1-Dichloroethane	ND	250	
1,2-Dichloroethene (Total)	ND	250	
Chloroform	ND	250	
1,2-Dichloroethane	ND	250	
2-Butanone	ND	1,250	
1,1,1-Trichloroethane	ND	250	
Carbon Tetrachloride	ND	250	
Vinyl Acetate	ND	1,250	
Bromodichloromethane	ND	250	
1,2-Dichloropropane	ND	250	
Cis-1,3-Dichloropropene	ND	250	
Trichloroethene	ND	250	
Dibromochloromethane	ND	250	
1,1,2-Trichloroethane	ND	250	

ND = Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-1 Client ID: CP-11513-38-40 45076-1

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	250	
Trans-1,3-Dichloropropene	ND	250	
Bromoform	ND	250	
4-Methyl-2-Pentanone	ND	1,250	
2-Hexanone	ND	250	
Tetrachloroethene	ND	250	
1,1,2,2-Tetrachloroethane	ND	250	
Toluene	26	250	J,B1
Chlorobenzene	ND	250	
Ethyl Benzene	ND	250	
Styrene	ND	250	
Total Xylenes	ND	250	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	100	88-110	81 - 117
Bromofluorobenzene	101	86-115	74 - 121
1,2-Dichloroethane-D4	82	76-114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-1 Client ID: CP-11513-38-40 45076-1

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 3-2-93
Date Analyzed: 3-5-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	400	
bis(2-Chloroethyl) ether	ND	400	
2-Chlorophenol	ND	400	
1,3-Dichlorobenzene	ND	400	
1,4-Dichlorobenzene	ND	400	
Benzyl Alcohol	ND	810	
1,2-Dichlorobenzene	ND	400	
2-Methylphenol	ND	400	
bis(2-Chloroisopropyl)ether	ND	400	
4-Methylphenol	ND	400	
N-Nitroso-Di-N-propylamine	ND	400	
Hexachloroethane	ND	400	
Nitrobenzene	ND	400	
Isophorone	ND	400	
2-Nitrophenol	ND	400	
2,4-Dimethylphenol	ND	400	
Benzoic Acid	ND	2,000	
bis(2-Chloroethoxy)methane	ND	400	
2,4-Dichlorophenol	ND	400	
1,2,4-Trichlorobenzene	ND	400	
Naphthalene	ND	400	
4-Chloroaniline	ND	810	
Hexachlorobutadiene	ND	400	
4-Chloro-3-methylphenol	ND	810	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-1 Client ID: CP-11513-38-40 45076-1

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	400	
Hexachlorocyclopentadiene	ND	400	
2,4,6-Trichlorophenol	ND	400	
2,4,5-Trichlorophenol	ND	400	
2-Chloronaphthalene	ND	400	
2-Nitroaniline	ND	2,000	
Dimethyl phthalate	ND	400	
Acenaphthylene	ND	400	
2,6-Dinitrotoluene	ND	400	
3-Nitroaniline	ND	2,000	
Acenaphthene	ND	400	
2,4-Dinitrophenol	ND	2,000	
4-Nitrophenol	ND	2,000	
Dibenzofuran	ND	400	
2,4-Dinitrotoluene	ND	400	
Diethylphthalate	ND	400	
4-Chlorophenyl phenyl ether	ND	400	
Fluorene	ND	400	
4-Nitroaniline	ND	2,000	
4,6-Dinitro-2-methylphenol	ND	2,000	
N-Nitrosodiphenylamine	ND	400	
4-Bromophenyl phenyl ether	ND	400	
Hexachlorobenzene	ND	400	
Pentachlorophenol	ND	2,000	
Phenanthrene	ND	400	
Anthracene	ND	400	
Di-n-butylphthalate	3,400	400	B1

ND - Not Detected

Continued . . . .

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-1 Client ID: CP-11513-38-40 45076-1

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	400	
Pyrene	ND	400	
Butyl benzyl phthalate	56	400	J
3,3'-Dichlorobenzidine	ND	810	
Benzo(a)anthracene	ND	400	
Chrysene	ND	400	
bis(2-ethylhexyl)phthalate	ND	400	
Di-n-octyl phthalate	ND	400	
Benzo(b)fluoranthene	ND	400	
Benzo(k)fluoranthene	ND	400	
Benzo(a)pyrene	ND	400	
Indeno(1,2,3-cd)pyrene	ND	400	
Dibenz(a,h)anthracene	ND	400	
Benzo(g,h,i)perylene	ND	400	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	52	35 - 114	23 - 120
2-Fluorobiphenyl	54	43 - 116	30 - 115
p-Terphenyl-d_{14}	61	33 - 141	18 - 137
Phenol-d_6	60	10 - 94	24 - 113
2-Fluorophenol	58	21 - 100	25 - 121
2,4,6-Tribromophenol	62	10 - 123	19 - 122

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-1 Client ID: CP-11513-38-40 45076-1

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 2-26-93
Date Analyzed: 3-1-93

Total Petroleum Fuel Hydrocarbons, mg/kg	< 10

SURROGATE RECOVERY, %	
1-Chlorooctane	114
o-terphenyl	112

TPH Per EPA Method 418.1
Date Extracted: 2-25-93
Date Analyzed: 2-25-93

Total Petroleum Hydrocarbons, mg/kg	35

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-1 Client ID: CP-106B-35-37 45076-2

Volatile Organics by Method 8240
Date Extracted: 3-2-93
Date Analyzed: 3-2-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	12	
Bromomethane	ND	12	
Vinyl Chloride	ND	12	
Chloroethane	ND	12	
Methylene Chloride	150	6	B1
Acetone	18	60	J,B1
Carbon Disulfide	2.0	6	J,B1
1,1-Dichloroethene	ND	6	
1,1-Dichloroethane	ND	6	
1,2-Dichloroethene (Total)	ND	6	
Chloroform	ND	6	
1,2-Dichloroethane	ND	6	
2-Butanone	ND	30	
1,1,1-Trichloroethane	ND	6	
Carbon Tetrachloride	ND	6	
Vinyl Acetate	ND	30	
Bromodichloromethane	ND	6	
1,2-Dichloropropane	ND	6	
Cis-1,3-Dichloropropene	ND	6	
Trichloroethene	ND	6	
Dibromochloromethane	ND	6	
1,1,2-Trichloroethane	ND	6	

ND = Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-2 Client ID: CP-106B-35-37 45076-2

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	6	
Trans-1,3-Dichloropropene	ND	6	
Bromoform	ND	6	
4-Methyl-2-Pentanone	ND	30	
2-Hexanone	ND	6	
Tetrachloroethene	ND	6	
1,1,2,2-Tetrachloroethane	ND	6	
Toluene	2.2	6	J,B1
Chlorobenzene	ND	6	
Ethyl Benzene	ND	6	
Styrene	ND	6	
Total Xylenes	ND	6	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	104	88-110	81 - 117
Bromofluorobenzene	97	86-115	74 - 121
1,2-Dichloroethane-D4	103	76-114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-2 Client ID: CP-106B-35-37 45076-2

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 3-2-93
Date Analyzed: 3-5-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	390	
bis(2-Chloroethyl) ether	ND	390	
2-Chlorophenol	ND	390	
1,3-Dichlorobenzene	ND	390	
1,4-Dichlorobenzene	ND	390	
Benzyl Alcohol	ND	770	
1,2-Dichlorobenzene	ND	390	
2-Methylphenol	ND	390	
bis(2-Chloroisopropyl)ether	ND	390	
4-Methylphenol	ND	390	
N-Nitroso-Di-N-propylamine	ND	390	
Hexachloroethane	ND	390	
Nitrobenzene	ND	390	
Isophorone	ND	390	
2-Nitrophenol	ND	390	
2,4-Dimethylphenol	ND	390	
Benzoic Acid	ND	1,900	
bis(2-Chloroethoxy)methane	ND	390	
2,4-Dichlorophenol	ND	390	
1,2,4-Trichlorobenzene	ND	390	
Naphthalene	ND	390	
4-Chloroaniline	ND	770	
Hexachlorobutadiene	ND	390	
4-Chloro-3-methylphenol	ND	770	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-2 Client ID: CP-106B-35-37 45076-2

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	390	
Hexachlorocyclopentadiene	ND	390	
2,4,6-Trichlorophenol	ND	390	
2,4,5-Trichlorophenol	ND	390	
2-Chloronaphthalene	ND	390	
2-Nitroaniline	ND	1,900	
Dimethyl phthalate	ND	390	
Acenaphthylene	ND	390	
2,6-Dinitrotoluene	ND	390	
3-Nitroaniline	ND	1,900	
Acenaphthene	ND	390	
2,4-Dinitrophenol	ND	1,900	
4-Nitrophenol	ND	1,900	
Dibenzofuran	ND	390	
2,4-Dinitrotoluene	ND	390	
Diethylphthalate	ND	390	
4-Chlorophenyl phenyl ether	ND	390	
Fluorene	ND	390	
4-Nitroaniline	ND	1,900	
4,6-Dinitro-2-methylphenol	ND	1,900	
N-Nitrosodiphenylamine	ND	390	
4-Bromophenyl phenyl ether	ND	390	
Hexachlorobenzene	ND	390	
Pentachlorophenol	ND	1,900	
Phenanthrene	ND	390	
Anthracene	ND	390	
Di-n-butylphthalate	2,400	390	B1

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-2 Client ID: CP-106B-35-37 45076-2

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	390	
Pyrene	ND	390	
Butyl benzyl phthalate	ND	390	
3,3'-Dichlorobenzidine	ND	770	
Benzo(a)anthracene	ND	390	
Chrysene	ND	390	
bis(2-ethylhexyl)phthalate	ND	390	
Di-n-octyl phthalate	ND	390	
Benzo(b)fluoranthene	ND	390	
Benzo(k)fluoranthene	ND	390	
Benzo(a)pyrene	ND	390	
Indeno(1,2,3-cd)pyrene	ND	390	
Dibenz(a,h)anthracene	ND	390	
Benzo(g,h,i)perylene	ND	390	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	47	35 - 114	23 - 120
2-Fluorobiphenyl	53	43 - 116	30 - 115
p-Terphenyl-d_{14}	59	33 - 141	18 - 137
Phenol-d_6	60	10 - 94	24 - 113
2-Fluorophenol	56	21 - 100	25 - 121
2,4,6-Tribromophenol	63	10 - 123	19 - 122

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-2 Client ID: CP-106B-35-37 45076-2

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 2-26-93
Date Analyzed: 3-1-93

Total Petroleum Fuel Hydrocarbons, mg/kg	< 10

SURROGATE RECOVERY, %	
1-Chlorooctane	117
o-terphenyl	114

TPH Per EPA Method 418.1
Date Extracted: 2-25-93
Date Analyzed: 2-25-93

Total Petroleum Hydrocarbons, mg/kg	35

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-3 Client ID: CP-106B-39-41 45076-3

Volatile Organics by Method 8240
Date Extracted: 3-1-93
Date Analyzed: 3-1-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	12	
Bromomethane	ND	12	
Vinyl Chloride	ND	12	
Chloroethane	ND	12	
Methylene Chloride	170	6	B1
Acetone	18	60	J,B1
Carbon Disulfide	ND	6	
1,1-Dichloroethene	ND	6	
1,1-Dichloroethane	ND	6	
1,2-Dichloroethene (Total)	ND	6	
Chloroform	ND	6	
1,2-Dichloroethane	ND	6	
2-Butanone	ND	30	
1,1,1-Trichloroethane	ND	6	
Carbon Tetrachloride	ND	6	
Vinyl Acetate	ND	30	
Bromodichloromethane	ND	6	
1,2-Dichloropropane	ND	6	
Cis-1,3-Dichloropropene	ND	6	
Trichloroethene	ND	6	
Dibromochloromethane	ND	6	
1,1,2-Trichloroethane	ND	6	

ND = Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-3 Client ID: CP-106B-39-41 45076-3

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	6	
Trans-1,3-Dichloropropene	ND	6	
Bromoform	ND	6	
4-Methyl-2-Pentanone	ND	30	
2-Hexanone	ND	6	
Tetrachloroethene	ND	6	
1,1,2,2-Tetrachloroethane	ND	6	
Toluene	2.8	6	J,B1
Chlorobenzene	ND	6	
Ethyl Benzene	ND	6	
Styrene	ND	6	
Total Xylenes	ND	6	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	101	88-110	81 - 117
Bromofluorobenzene	99	86-115	74 - 121
1,2-Dichloroethane-D4	96	76-114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-3 Client ID: CP-106B-39-41 45076-3

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 3-2-93
Date Analyzed: 3-10-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	400	
bis(2-Chloroethyl) ether	ND	400	
2-Chlorophenol	ND	400	
1,3-Dichlorobenzene	ND	400	
1,4-Dichlorobenzene	ND	400	
Benzyl Alcohol	ND	800	
1,2-Dichlorobenzene	ND	400	
2-Methylphenol	ND	400	
bis(2-Chloroisopropyl)ether	ND	400	
4-Methylphenol	ND	400	
N-Nitroso-Di-N-propylamine	ND	400	
Hexachloroethane	ND	400	
Nitrobenzene	ND	400	
Isophorone	ND	400	
2-Nitrophenol	ND	400	
2,4-Dimethylphenol	ND	400	
Benzoic Acid	ND	2,000	
bis(2-Chloroethoxy)methane	ND	400	
2,4-Dichlorophenol	ND	400	
1,2,4-Trichlorobenzene	ND	400	
Naphthalene	ND	400	
4-Chloroaniline	ND	800	
Hexachlorobutadiene	ND	400	
4-Chloro-3-methylphenol	ND	800	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-3 Client ID: CP-106B-39-41 45076-3

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	400	
Hexachlorocyclopentadiene	ND	400	
2,4,6-Trichlorophenol	ND	400	
2,4,5-Trichlorophenol	ND	400	
2-Chloronaphthalene	ND	400	
2-Nitroaniline	ND	2,000	
Dimethyl phthalate	ND	400	
Acenaphthylene	ND	400	
2,6-Dinitrotoluene	ND	400	
3-Nitroaniline	ND	2,000	
Acenaphthene	ND	400	
2,4-Dinitrophenol	ND	2,000	
4-Nitrophenol	ND	2,000	
Dibenzofuran	ND	400	
2,4-Dinitrotoluene	ND	400	
Diethylphthalate	ND	400	
4-Chlorophenyl phenyl ether	ND	400	
Fluorene	ND	400	
4-Nitroaniline	ND	2,000	
4,6-Dinitro-2-methylphenol	ND	2,000	
N-Nitrosodiphenylamine	ND	400	
4-Bromophenyl phenyl ether	ND	400	
Hexachlorobenzene	ND	400	
Pentachlorophenol	ND	2,000	
Phenanthrene	ND	400	
Anthracene	ND	400	
Di-n-butylphthalate	2,800	400	B1

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Lab No. 30379-3 Client ID: CP-106B-39-41 45076-3

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	400	
Pyrene	ND	400	
Butyl benzyl phthalate	ND	400	
3,3'-Dichlorobenzidine	ND	800	
Benzo(a)anthracene	ND	400	
Chrysene	ND	400	
bis(2-ethylhexyl)phthalate	ND	400	
Di-n-octyl phthalate	ND	400	
Benzo(b)fluoranthene	ND	400	
Benzo(k)fluoranthene	ND	400	
Benzo(a)pyrene	ND	400	
Indeno(1,2,3-cd)pyrene	ND	400	
Dibenz(a,h)anthracene	ND	400	
Benzo(g,h,i)perylene	ND	400	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	50	35 - 114	23 - 120
2-Fluorobiphenyl	52	43 - 116	30 - 115
p-Terphenyl-d_{14}	57	33 - 141	18 - 137
Phenol-d_6	61	10 - 94	24 - 113
2-Fluorophenol	59	21 - 100	25 - 121
2,4,6-Tribromophenol	68	10 - 123	19 - 122

Continued . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental - Seattle
Project: 624878
Lab No. 30379

March 22, 1993

Lab No. 30379-3 Client ID: CP-106B-39-41 45076-3

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 2-26-93
Date Analyzed: 3-1-93

Total Petroleum Fuel Hydrocarbons, mg/kg	< 10

SURROGATE RECOVERY, %	
1-Chlorooctane	113
o-terphenyl	105

TPH Per EPA Method 418.1
Date Extracted: 2-25-93
Date Analyzed: 2-25-93

Total Petroleum Hydrocarbons, mg/kg	20

SOUND ANALYTICAL SERVICES

Andrew J. Riddell

ANDREW J. RIDDELL

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

TPH by Method 418.1

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc1
Units: mg/kg
Date: March 22, 1993

METHOD BLANK

Parameter	Blank Value
Total Petroleum Hydrocarbons	< 10

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc2
Matrix: Soil
Units: mg/kg
Date: March 22, 1993

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 30379-3

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	RPD
Total Petroleum Fuel Hydrocarbons	< 10	390	402	97	330	17

BLANK SPIKE RECOVERY

BS No. 034R0301.D

Parameter	Spike Added	Spike Recovered	%R
Total Petroleum Fuel Hydrocarbons	402	312	78

%R = Percent Recovery
= [(MS - SR) / SA] x 100

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc2
Matrix: Soil
Units: mg/kg
Date: March 22, 1993

METHOD BLANK

Blank No. 033R0101.D

Parameter	Blank Value
Total Petroleum Fuel Hydrocarbons	< 10
SURROGATE RECOVERY%	
1-chlorooctane	116
o-terphenyl	112

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

WATER MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental, Seattle Office
Lab No: 30379qc3
Date: March 22, 1993

SEMI-VOLATILE ORGANICS

COMPOUND	SPIKE (ug/kg)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD	FLAGS
Phenol	3,900	ND	1,900	49	2,200	56	13	
2-Chlorophenol	3,900	ND	1,800	46	2,000	51	10	
1,4-Dichlorobenzene	3,900	ND	610	16	510	13	21	X6
N-nitrosodi-n-Propylamine	3,900	ND	2,200	56	2,200	56	0.0	
1,2,4-Trichlorobenzene	3,900	ND	1,200	31	1,100	28	10	X6
4-Chloro-3-Methylphenol	3,900	ND	2,000	51	2,300	59	15	
Acenaphthene	3,900	ND	2,100	54	2,100	54	0.0	
4-Nitrophenol	3,900	ND	2,300	59	2,800	72	20	
2,4 Dinitrotoluene	3,900	ND	2,200	56	2,300	59	5.2	
Pentachlorophenol	3,900	ND	1,500	38	1,900	49	25	
Pyrene	3,900	ND	2,200	56	2,300	59	5.2	

RPD = Relative Percent Difference
% REC = Percent Recovery

ADVISORY LIMITS:	RPD	% RECOVERY
Phenol	42	12 - 89
2-Chlorophenol	40	27 -123
1,4-Dichlorobenzene	28	36 - 97
N-nitrosodi-n-Propylamine	38	41 -116
1,2,4-Trichlorobenzene	28	39 - 98
4-Chloro-3-Methylphenol	42	23 - 97
Acenaphthene	31	46 -118
4-Nitrophenol	50	10 - 80
2,4 Dinitrotoluene	38	24 - 96
Pentachlorophenol	50	9 -103
Pyrene	31	26 -127

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc4
Units: ug/kg
Date: March 22, 1993
Blank No: SBLK52-S8032

METHOD BLANK

Compound	Result	PQL	Flags
Phenol	ND	330	
bis(2-Chloroethyl) ether	ND	330	
2-Chlorophenol	ND	330	
1,3-Dichlorobenzene	ND	330	
1,4-Dichlorobenzene	ND	330	
Benzyl Alcohol	ND	670	
1,2-Dichlorobenzene	ND	330	
2-Methylphenol	ND	330	
bis(2-Chloroisopropyl)ether	ND	330	
4-Methylphenol	ND	330	
N-Nitroso-Di-N-propylamine	ND	330	
Hexachloroethane	ND	330	
Nitrobenzene	ND	330	
Isophorone	ND	330	
2-Nitrophenol	ND	330	
2,4-Dimethylphenol	ND	330	
Benzoic Acid	ND	1,700	
bis(2-Chloroethoxy)methane	ND	330	
2,4-Dichlorophenol	ND	330	
1,2,4-Trichlorobenzene	ND	330	
Naphthalene	ND	330	
4-Chloroaniline	ND	670	
Hexachlorobutadiene	ND	330	
4-Chloro-3-methylphenol	ND	670	
2-Methylnaphthalene	ND	330	
Hexachlorocyclopentadiene	ND	330	
2,4,6-Trichlorophenol	ND	330	
2,4,5-Trichlorophenol	ND	330	
2-Chloronaphthalene	ND	330	
2-Nitroaniline	ND	1,700	
Dimethyl phthalate	ND	330	
Acenaphthylene	ND	330	

PQL - Practical Quantitation Limit
ND - Not Detected

SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc4
Units: ug/kg
Date: March 22, 1993
Blank No: SBLK52-S8032

METHOD BLANK

Compound	Result	PQL	Flags
3-Nitroaniline	ND	1,700	
Acenaphthene	ND	330	
2,4-Dinitrophenol	ND	1,700	
4-Nitrophenol	ND	1,700	
Dibenzofuran	ND	330	
2,4-Dinitrotoluene	ND	330	
2,6-Dinitrotoluene	ND	330	
Diethylphthalate	ND	330	
4-Chlorophenyl phenyl ether	ND	330	
Fluorene	ND	330	
4-Nitroaniline	ND	1,700	
4,6-Dinitro-2-methylphenol	ND	1,700	
N-Nitrosodiphenylamine	ND	330	
4-Bromophenyl phenyl ether	ND	330	
Hexachlorobenzene	ND	330	
Pentachlorophenol	ND	1,700	
Phenanthrene	ND	330	
Anthracene	ND	330	
Di-n-butylphthalate	1,200	330	
Fluoranthene	ND	330	
Pyrene	ND	330	
Butyl benzyl phthalate	ND	330	
3,3'-Dichlorobenzidine	ND	670	
Benzo(a)anthracene	ND	330	
bis(2-ethylhexyl)phthalate	ND	330	
Chrysene	ND	330	
Di-n-octyl phthalate	ND	330	
Benzo(b)fluoranthene	ND	330	
Benzo(k)fluoranthene	ND	330	
Benzo(a)pyrene	ND	330	
Indeno(1,2,3-cd)pyrene	ND	330	
Dibenz(a,h)anthracene	ND	330	
Benzo(g,h,i)perylene	ND	330	

PQL - Practical Quantitation Limit
ND - Not Detected

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Seattle' Office
Lab No: 30379qc4
Date: March 22, 1993
Blank No: SBLK52-S8032

METHOD BLANK

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d5	40	35 - 114	23 - 120
2-Fluorobiphenyl	40	43 - 116	30 - 115
p-Terphenyl-d14	41	33 - 141	18 - 137
Phenol-d6	39	10 - 94	24 - 113
2-Fluorophenol	40	21 - 100	25 - 121
2,4,6-TBP	38	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc5
Units: ug/kg
Date: March 22, 1993
Blank No: V8773

METHOD BLANK

Date Analyzed: 3-1-93

Compound	Result	PQL	FLAGS
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	57	5	
Acetone	14	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	0.8	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

PQL - Practical Quantitation Limit
ND - Not Detected

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc5
Date: March 22, 1993
Blank No: V8773

METHOD BLANK

Date Analyzed: 3-1-93

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Toluene - d8	102	86 - 115	81 - 117
Bromofluorobenzene	97	76 - 114	74 - 121
1,2-Dichloroethane d4	98	88 - 110	70 - 121

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc5
Units: ug/kg
Date: March 22, 1993
Blank No: V8828

METHOD BLANK

Date Analyzed: 3-2-93

Compound	Result	PQL	FLAGS
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	78	5	
Acetone	7.6	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	1.2	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

PQL - Practical Quantitation Limit
ND - Not Detected

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc5
Date: March 22, 1993
Blank No: V8828

METHOD BLANK

Date Analyzed: 3-2-93

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Toluene - d8	101	86 - 115	81 - 117
Bromofluorobenzene	100	76 - 114	74 - 121
1,2-Dichloroethane d4	96	88 - 110	70 - 121

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc5
Units: ug/kg
Date: March 22, 1993
Blank No: V8847

METHOD BLANK

Date Analyzed: 3-3-93

Compound	Result	PQL	FLAGS
Chloromethane	ND	400	
Bromomethane	ND	400	
Vinyl Chloride	ND	400	
Chloroethane	ND	400	
Methylene Chloride	180	200	J
Acetone	ND	2000	
Carbon Disulfide	ND	200	
1,1-Dichloroethene	ND	200	
1,1-Dichloroethane	ND	200	
1,2-Dichloroethene (Total)	ND	200	
Chloroform	ND	200	
1,2-Dichloroethane	ND	200	
2-Butanone	ND	1000	
1,1,1-Trichloroethane	ND	200	
Carbon Tetrachloride	ND	200	
Vinyl Acetate	ND	1000	
Bromodichloromethane	ND	200	
1,2-Dichloropropane	ND	200	
Cis-1,3-Dichloropropene	ND	200	
Trichloroethene	ND	200	
Dibromochloromethane	ND	200	
1,1,2-Trichloroethane	ND	200	
Benzene	ND	200	
Trans-1,3-Dichloropropene	ND	200	
Bromoform	ND	200	
4-Methyl-2-Pentanone	ND	1000	
2-Hexanone	ND	200	
Tetrachloroethene	ND	200	
1,1,2,2-Tetrachloroethane	ND	200	
Toluene	ND	200	
Chlorobenzene	ND	200	
Ethyl Benzene	ND	200	
Styrene	ND	200	
Total Xylenes	ND	200	

PQL - Practical Quantitation Limit
ND - Not Detected

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Seattle Office
Lab No: 30379qc5
Date: March 22, 1993
Blank No: V8847

METHOD BLANK

Date Analyzed: 3-3-93

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Control Limits Soil
Toluene - d8	99	86 - 115	81 - 117
Bromofluorobenzene	97	76 - 114	74 - 121
1,2-Dichloroethane d4	86	88 - 110	70 - 121

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

VOLATILE ORGANICS - METHOD 8240

Client Name: Burlington Environmental, Seattle Office
Lab Number: 30379qc6
Units: ug/kg
Date: March 22, 1993

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spiked Dup Result (MSD)	Spike Added (SA)	%R	RPD
1,1-Dichloroethene	< 6.0	55	55	100	52	55	94.5	5.6
Trichloroethene	< 6.0	59	55	107	56	55	102	5.2
Chlorobenzene	< 6.0	61	55	111	61	55	111	0.0
Toluene	< 6.0	66	55	120	65	55	118	1.5
Benzene	< 6.0	60	55	109	63	55	115	4.9

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2] x 100

% REC = Percent Recovery
= [(MS - SAMPLE RESULT) / SPIKE] x 100

*QC Limits:

	RPD	% RECOVERY
1,1-Dichloroethene	22	59-172
Trichloroethene	24	62-137
Chlorobenzene	21	60-133
Toluene	21	59-139
Benzene	21	66-142

* These are advisory limits only.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

C: The identification of this analyte was confirmed by GC/MS.

B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final exract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

E: The concentration of this analyte exceeded the instrument calibration range.

D: The reported result for this analyte is calculated based on a secondary dilution factor.

A: This TIC is a suspected aldol-condensation product.

M: Quantitation Limits are elevated due to matrix interferences.

S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.

X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.

X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.

X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike was diluted out during analysis.

X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.

X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.

X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.

X8: Surrogate was diluted out during analysis.

X9: Surrogate recovery outside QC limits due to matrix composition.

X10: Surrogate recovery outside QC limits due to high contaminant levels.

CHAIN OF CUSTODY

BURLINGTON ENVIRONMENTAL
2203 Airport Way South, Suite 400
Seattle, WA 98134
206-223-0500 • FAX: 223-7791

Chain of Custody/ Laboratory Analysis Request

DATE 2-24-93 PAGE 1 OF 1

PROJECT PGI - Project # 624878
CLIENT INFO. CONTACT K. KRUPS Task # 7304
CHEMPRO DIVISION/GENERATOR NAME
TELEPHONE # 223-0500
SAMPLERS NAME J. Peale PHONE #
SAMPLERS SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	TYPE
1 CP-11513-38-46	2-12-93	11:00	45076-1	soils
2 CP-106B-35-37	2-19-93	1140	45076-2	↓
3 CP-106B-39-41	2-19-93	1330	45076-3	↓
4.				
5.				
6.				
7.				
8.				

ANALYSIS REQUESTED

BASE/NEU/ACID ORGAN. GC/MS/625/8270	VOLATILE ORGANICS GC/MS/624/8240	PCB's 608/8080	TPH (circle method) 418.1 / 8015 (both)	BETX (circle method) 8240 or 8020	F-LISTED SOLVENTS 8240	TCLP F-LISTED SOLVENTS 1311/8240	TCLP METALS D004-11	METALS (TOTAL) As. Ba. Cd. Cr. Cu. Pb. Ni. Hg. Ag. Se. Tl. Sb. Zn	TCLP ORGANICS (specify methods) • VOA's 8240 • BNA's 8270 • Pesticides 8080 • Herbicides 8150	DISCHARGE TESTING	OTHER (Specify)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
X	X		X									2	
X	X		X									2	
X	X		X									2	

Relinquished By	Relinquished By	Relinquished By
Signature T. Claus	Signature	Signature
Printed Name T. Claus	Printed Name JOE PALMQUIST	Printed Name
Firm BEI	Firm SAS	Firm
Date/Time 2-24-93	Date/Time 2/24 12:30P	Date/Time
Received By	**Received By**	**Received By**
Signature	Signature Mary Curtiss	Signature
Printed Name J PALMQUIST	Printed Name SAS	Printed Name
Firm SAS	Firm 2/24/93 12:20	Firm
Date/Time 2-24 10:20A	Date/Time	Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

Analyze and report according to BEI Technical Services QC requirements.

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator.